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E-mail: penerbit@salam.uitm.edu.my

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Course Note Delivery on Mobile Facebook

Serge Gabarre^{1*}, Cécile Gabarre² and Rosseni Din³

¹Faculty of Modern Languages and Communication,
Universiti Putra Malaysia,
43400 Serdang, Selangor, Malaysia
serge@upm.edu.my

²Faculty of Modern Languages and Communication,
Universiti Putra Malaysia,
43400 Serdang, Selangor, Malaysia
cecile@upm.edu.my

³Faculty of Education, Universiti Kebangsaan Malaysia,
43600 UKM Bangi, Selangor, Malaysia
rosseni@yahoo.com

*Corresponding Author

ABSTRACT

The present study reports on a longitudinal research which sought to explore how Facebook on smartphones could be used to replace an institutional learning management system. A review of the literature revealed that very little articles had been published on the incorporation of both technologies in education. A grounded action research method was employed over a period of one and a half year in three French as a foreign language courses. The action research implementation was two-fold as it included the delivery of course notes and the sharing of learner-created documents. Data collection was conducted through online observations and interviews. A systematic grounded theory approach was used during the six cycles of analysis. Findings revealed issues with the implementation which were corrected over time. Overall, students positively responded to the new platform of delivery. A working model describing learning a foreign language with Facebook on smartphones was constructed, and best practices guidelines were identified. These are discussed in the perspectives of mobile assisted language learning, task-based learning, and social networking learning.

Keywords: *Action research; grounded theory; language learning; m-Learning; SNS-Learning; critical review*

INTRODUCTION

This article relates how a study was conducted to incorporate Facebook on smart phones in order to resolve issues faced with an institutional learning management system (LMS). Indeed students reported that the university's LMS was slow, it did not provide them with notifications, and it could not be accessed on their mobile phones. Gabarre and Gabarre (2009b) suggested that these issues could be resolved by using mobile Facebook to replace the LMS. A critical review of the literature revealed that very little research had been conducted on this topic. The Methodology section describes how a grounded action research was conducted to evaluate the delivery of lecture notes on mobile Facebook. Findings are reported and discussed in accordance with this qualitative method.

STATEMENT OF THE PROBLEM

A study conducted in the same institution by Gabarre and Gabarre (2010b) revealed that students viewed their university LMS as a platform which only served the purpose of pushing learning material to them. Students explained that they would only access the system whenever their lecturer would inform them that a new course note had been posted. Three main issues, which the present study sought to resolve, were identified. First, students explained that navigating through the different pages of the LMS in order to access the course note was a painstakingly slow process. Although it was originally believed that poor access to the Internet was the reason for this issue, initial investigations revealed that access to other websites was not similarly affected. Second, students remarked that unless they were informed by their lecturer during the class of a new activity on the LMS, they would need to randomly access the platform to check for new postings. To a certain extent, this requirement to inform the students through a face-to-face channel defeated the purpose of using a blended mode of teaching. Third, students explained that the LMS which was used to host their course could not be readily accessed on their mobile devices. With the growing popularity of smartphones, it has been observed that such devices have become the students' first source for in-class reference to learning material. Depriving the students of access to the LMS while in-class diminished the function of the lecture course notes in favour of information garnered from

the Internet. In order to resolve these issues, a reflection on past experiences with social networking sites (SNS) and mobile devices was conducted. It was envisioned that delivering course notes through Facebook on mobile phones could offer a solution to these three issues. Three questions reflecting the exploratory nature of the research need were formulated: (1) How can a mobile Facebook implementation improve the students' learning experience in terms of course material delivery? (2) What processes do foreign language learners go through when using a mobile Facebook setup? (3) What are the difficulties encountered in a mobile Facebook scenario? The formulation of these three questions prompted a qualitative approach as will be described in the Methodology section.

THEORETICAL AND CONCEPTUAL FRAMEWORK

In this study, two theories were employed to address the delivery of lecture course notes on a mobile SNS. Sharples, Taylor and Vavoula's (2007) theory of mobile learning was employed to describe the concept of course note delivery on mobile devices. Vygotsky's (1934/1962) social constructivist theory was selected for its ability to describe the learning process within a group. Even though this group would at time meet in a virtual online learning context, as is the case with an SNS, social constructivism remains a valid theory. Six concepts (task-based learning, exposure to foreign language, ubiquitous access to lecture notes, learner created document sharing, familiar environment, and peer-learning) derived from these two theories and from recent literature (Kukulska-Hulme & Bull, 2009; Ros i Solé, Calic, & Neijmann, 2010; Wang, Wiesemes, & Gibbons, 2012) on Mobile Assisted Language Learning (MALL) formed the basis of the conceptual framework. This conceptual framework, illustrated in Figure 1, was used to implement the action research study which was conducted over the course of three semesters with one cohort of students learning French.

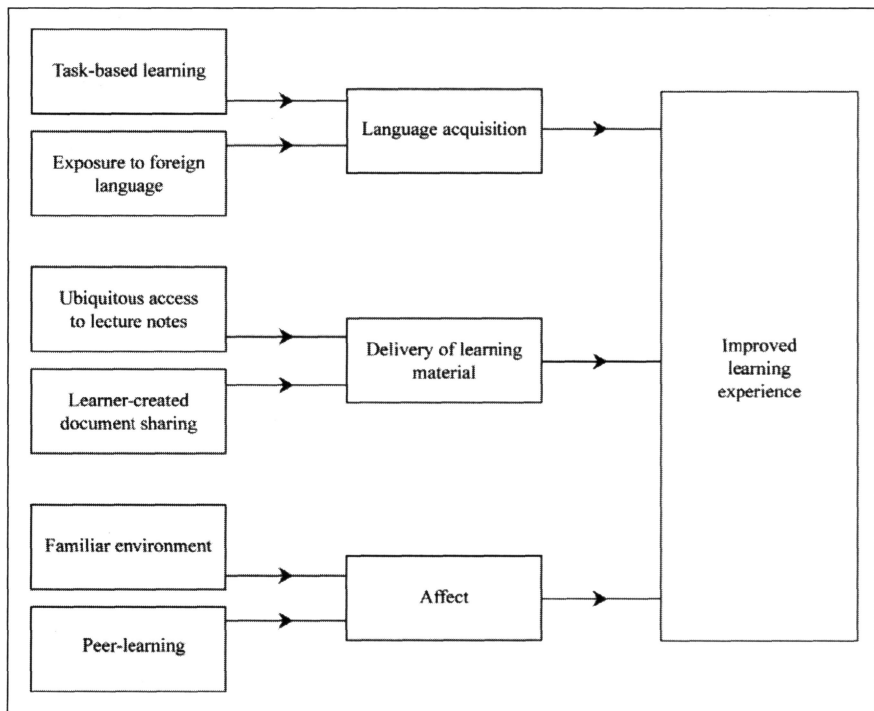


Figure 1: Conceptual Framework

OPERATIONAL DEFINITION

The operational definition of course content delivery is provided here in order to clarify the use of this term throughout this article. Delivery of course content can be articulated around two directions of movement: push and pull. Within the field of mobile technologies, push refers to the movement of data from the service provider to the user. As such, the user does not request each segment of information which the mobile operator seamlessly delivers to the mobile device. When used in m-Learning, this term also describes the delivery of information to the students. The instructor pushes learning material to each student's mobile phone using SMSs, multimedia messages (MMS) or e-mails without them initiating the request (Traxler & Riordan, 2003). This type of movement follows the instructor to learner direction, and consequently leaves less initiative to the students.

Logically, pull is the converse concept of push. Mobile technologies refer to pull as a user initiated demand. Likewise in m-Learning, the concept of pull refers to a request which originated with the students. This can take multiple forms, such as direct request for information through SMS and emails, or even retrievals from online depositories. In the latter example, students access remote servers where learning objects are located. Pull is marked by a student initiated request which answers a specific learning need. Consequently, the responsibility of exchanges is placed on the learners' side. The use of both push and pull mobile exchanges can concurrently occur within the classroom during formal learning (Lindquist et al., 2007; Wang, Shen, Novak, & Pan, 2008), or outside with the freedom offered by mobile technologies (Gabarre & Gabarre, 2009a). In this article, delivery of course content is defined as the distribution of course content initiated through both push and pull.

LITERATURE REVIEW

A literature review seeks to describe the current knowledge pertaining to a particular domain. Such a review can be conducted linearly by first dividing the main topic into different segments and by addressing each issue sequentially. Guzzo et al. (1987) argued that this narrative review of the literature could be subjected to bias from the researcher as a selection of articles is always a personal interpretation of relevance. Alternatively, they proposed that a critical review of the literature could be performed in order to categorise the existing understanding on a specific subject. According to Rosenthal and DiMatteo (2001) a critical review offers undeniable advantages as it grants social science researchers a clear view of all research findings in their specific area through a critical review. Furthermore, conducting a critical review incites researchers to adopt a rigorous survey and review of all available documents. By combining research findings obtained from various paradigms and methodologies, the critical review offers a richer picture of the subject that is being investigated.

Critical Review of the Literature

Guzzo et al. (1987) as well as Egger et al. (1997) recommended approaching the task of conducting a critical review in the same fashion as a

quantitative study. As such, the three steps to be followed are “formulation of the problem to be addressed, collection and analysis of the data, and reporting of the results” (Egger, et al., 1997, p. 1533).

The primary reason for conducting the present critical review was to investigate the extent of the current knowledge on learning a foreign language with social networking sites on mobile phones. By pursuing the analogy presented by Egger et al. (1997), the problem that is addressed was formulated with the following question: to what extent do recent and respected publications deal with the theme of learning a foreign language with social networking sites and mobile devices? This question can be divided into five different variables: (1) recent publications, (2) respected publications, (3) learning a foreign language, (4) learning with social networking sites, and (5) learning with mobile devices. These five variables were used to categorise the articles that were selected in the critical review.

For Guzzo et al. (1987), all reviews of the literature should be exhaustive and at the same time “deal with a bounded domain of studies” (Guzzo et al., 1987, p. 418). As such, a thorough search of all pertinent articles was conducted before these were subsequently selected for relevance. In doing so, keywords related to the theme of SNS, m-Learning, and language learning with technology, were used to find articles on four online services: the ERIC database, the EBSCO server, the JSTOR service, and the Google Scholar website. Furthermore, articles were also sourced from seven publishers’ website: Elsevier, Emerald, Routledge, Sage, Springer, Taylor & Francis, and Wiley. When a relevant article was located in a journal, the researcher searched systematically through archival issues to identify additional articles. Although a systematic method was established to review a maximum of relevant articles, the possibility that some publications escaped this process remains.

From the five variables retained to classify the selected articles, learning a foreign language, learning with social networking sites, and learning with mobile devices are self-explanatory. On the other hand, recent publications and respected publications require some clarification. First, the recent publication variable was addressed by excluding all publications prior to the year 2010. Klavans and Boyack (2007) noted that the time frame used to analyse new scientific literature should reflect the stability

of science in that particular field. A long time frame assumes that science is stable, whereas a short one presupposes that the field is rapidly evolving. The decision to filter out all articles which dealt with older technologies was made in light of the rapid changes that occur in the domain of mobile phones and SNSs. This decision was based on Ceruzzi's (2005) remarks that the pace of development of information and communication technologies followed an exponential path.

Second, the respected publication variable was ensured by only including articles published in journals referenced by the Institute for Scientific Information (ISI) or Elsevier's Scopus. This decision was taken to ensure a constant level of quality in the articles. Although Google Scholar offers a convenient way to access online papers, the quality of the results remains inconsistent, as noted by Falagas et al. (2008). On the other hand, Butler (2003) confirmed that publications indexed by ISI were generally viewed as a benchmark to measure performance in scientific publications. Although it could be suggested that limiting the critical review to include only two indexing services risks distorting the view of the current literature, Klavans and Boyak (2007) noted that both ISI and Scopus indexed publications were representative of the scientific literature.

As can be seen in Table 1, a total of 59 articles were selected for the review of the literature. The first finding that is reported in this critical review relates to the lack of articles dealing with all three aspects of the current research: mobile learning, SNS-Learning, and language learning. At best, articles reported findings on two of these aspects (27% of all articles), but the majority focused on only one. This clearly represents a gap in the current knowledge of learning a foreign language with these two technologies.

Table 1: Critical Review of the Literature

	Authors	Year	Journal	ML	SL	LLT	MY	Country
1	Başoğlu, Akdemir	2010	Turkish Online Journal of Educational Technology	✓	✓	✓		Turkey
2	Ros i Solé et al.	2010	ReCALL	✓	✓	✓		UK
3	Stockwell	2010	Language Learning & Technology	✓	✓	✓		Japan
4	Wong, Looi	2010	Journal of Computer Assisted Learning	✓	✓	✓		Singapore
5	Chang, Hsu	2011	Computer Assisted Language Learning	✓	✓	✓		Taiwan
6	Hayati et al.	2011	British Journal of Educational Technology	✓	✓	✓		Iran
7	Huang et al.	2011	British Journal of Educational Technology	✓	✓	✓		Taiwan
8	Nah	2011	Computer Assisted Language Learning	✓	✓	✓		Korea
9	Wong et al.	2011	Journal of Computer Assisted Learning	✓	✓	✓		Singapore
10	Chen et al.	2012	Australasian Journal of Educational Technology	✓	✓	✓		Taiwan
11	Hsu	2012	Computer Assisted Language Learning	✓	✓	✓		Taiwan
12	Hwang, Chen	2011	Computer Assisted Language Learning	✓	✓	✓		Taiwan
13	Kondo et al.	2012	ReCALL	✓	✓	✓		Japan
14	Oberg, Daniels	2012	Computer Assisted Language Learning	✓	✓	✓		Japan
15	Beckmann	2010	Distance Education	✓				Australia
16	Daher	2010	Australasian Journal of Educational Technology	✓				Israel
17	Du et al.	2010	Journal of the American Society for Information Science and Technology	✓				NA
18	Gupta, Koo	2010	International Journal of Information and Communication Technology Education	✓				NA
19	Isham Shah Hassan et al.	2010	Turkish Online Journal of Educational Technology	✓			✓	Malaysia
20	Mifsud, Mørch	2010	Journal of Computer Assisted Learning	✓				USA / Norway

	Authors	Year	Journal	ML	SL	LLT	MY	Country
21	Coulby et al.	2011	British Journal of Educational Technology	✓				UK
22	Goh et al.	2011	British Journal of Educational Technology	✓				New Zealand
23	Kert	2011	Turkish Online Journal of Educational Technology	✓				Turkey
24	Looi et al.	2011	Journal of Computer Assisted Learning	✓				Singapore
25	Shih et al.	2011	British Journal of Educational Technology	✓				NA
26	Boticki et al.	2012	Computer Applications in Engineering Education	✓				Croatia
27	Kinash et al.	2012	Australasian Journal of Educational Technology	✓				NA
28	Santos, Ali	2012	Education and Information Technologies	✓				UAE
29	Schepman et al.	2012	Computers in Human Behavior	✓				UK
30	Wang, Wiesemens et al.	2012	Computers & Education	✓				UK
31	Yen et al.	2012	British Journal of Educational Technology	✓				Taiwan
32	Elavsky et al.	2011	Learning, Media and Technology	✓	✓			NA
33	Kabilan et al.	2010	Internet and Higher Education		✓	✓	✓	Malaysia
34	Arnold, Paulus	2010	Internet and Higher Education		✓			USA
35	Baran	2010	British Journal of Educational Technology		✓			Turkey
36	Brady et al.	2010	Journal of Interactive Online Learning		✓			USA
37	Hung, Yuen	2010	Teaching in Higher Education		✓			Taiwan
38	Junco et al.	2011	Journal of Computer Assisted Learning		✓			USA
39	Mazman, Usluel	2010	Computers & Education		✓			NA
40	McCarthy	2010	Australasian Journal of Educational Technology		✓			Australia
41	Yu et al.	2010	Computers & Education		✓			Hong-Kong
42	Domínguez-Flores, Wang	2011	Journal of Academic Librarianship		✓			Puerto Rico

	Authors	Year	Journal	ML	SL	LLT	MY	Country
43	Feuer	2011	Library Hi Tech News		✓			USA
44	George, Dellasega	2011	Medical Education		✓			USA
45	Goodband et al.	2011	Learning, Media and Technology		✓			UK
46	Hrastinski, Aghaee	2011	Education and Information Technologies		✓			Sweden
47	Lampe et al.	2011	Computer-Supported Collaborative Learning		✓			USA
48	Loving, Ochoa	2011	New Library World		✓			USA
49	Mills, Chandra	2011	Journal of Adolescent & Adult Literacy		✓			Australia
50	Chen, Bryer	2012	International Review of Research in Open and Distance Learning		✓			USA
51	Chen, Chen	2012	British Journal of Educational Technology		✓			Taiwan
52	Junco et al.	2012	British Journal of Educational Technology		✓			NA
53	Lambropoulos et al.	2012	British Journal of Educational Technology		✓			Greece
54	LaRue	2012	Teaching and Learning in Nursing		✓			NA
55	Ractham et al.	2012	Decision Sciences Journal of Innovative Education		✓			Thailand
56	Rambe	2012	Australasian Journal of Educational Technology		✓			South Africa
57	Veletsianos, Navarrete	2012	International Review of Research in Open and Distance Learning		✓			USA
58	Wang, Woo et al.	2012	British Journal of Educational Technology		✓			Singapore
59	Wood et al.	2012	Computers & Education		✓			NA

Articles were almost equally distributed between these two technologies with research on m-Learning accounting for 53% of all academic journals, while those on SNSs accounted for 47%. Unexpectedly, a large majority (93%) of articles which reported on language learning also dealt with mobile learning. Only one article described a study which used SNSs to investigate language learning. This finding highlights a second knowledge gap which strongly warrants additional research in this field.

The Asian continent figures prominently among the articles selected for the critical review with 52% of all publications where a geographical setting was identified. On the other hand, Northern America (20%) and Europe (18%) account together for just over a third of all articles. Additionally, the analysis of the literature revealed a scarcity of articles reporting findings from research conducted in Malaysia. Indeed, from a total of 59 articles, only two (3%) reported on the Malaysian context. As such, this finding represents a third gap in the literature.

The main implication that resulted from the critical review was the discovery of three gaps in the literature. These were (1) the absence of findings on learning a foreign language with social networking sites on mobile phones, (2) the virtual absence of research on language learning with SNSs, and (3) the scarcity of studies conducted in Malaysia with either of these two technologies. The following section will review findings from the 59 articles selected in the critical review to respectively report on the current knowledge on the delivery of learning material on mobile devices.

Mobile Phones as Delivery Tools

A mobile phone is first of all a device used to communicate without being fixed to any given location. Consequently, m-Learning scenarios which involve mobile phones may include a communicative dimension. This is not the case when the mobile devices used are not connected to a network, as was illustrated in Ros i Solé et al.'s (2010) experiment which made use of MP3 players to practise foreign language learning outside of the classroom. Although the vast majority of research on m-Learning is carried out with mobile phones (Wu et al., 2012), not all of them use the communicative dimension of these devices.

Studies which made an extensive use of mobile devices for their communicative features focused on specific aspects of the device. For example, Kert (2011) used the short message service (SMS) feature of the mobile phones to send the students lecture notes related to computer programming. In this research, the student who received the lecture notes via their mobile phones experienced higher academic achievements than the control group. In a comparable experiment, Goh et al. (2012) used SMSs to positively stimulate students in their academic activities. Similarly investigating the communicative dimension of mobile phones, Santos and Ali (2012) discovered that SMSs were prominently used in informal learning among students. However, SMSs are perhaps not the best way to deliver course content as highlighted by Wang and Shen (2012). They noted that students preferred to receive learning material in the form of short videos. Similarly, Gupta and Koo (2010, p. 82) discovered that students considered listening to lectures on their mobile devices “the most useful educational activity”. However, rich multimedia documents might not always be compatible with all mobile phones, and furthermore, sending them may prove to be taxing on the network, thus causing delays in the delivery.

Richer than SMSs, the multimedia messaging service (MMS) offers the possibility of sending small documents and bypasses the need of browsing mobile Internet. This service was used by Hsu (2012) who explored in situ learning at the night market. In this study, students received instructions for their language learning task through their mobile phones, and subsequently sent their lecturer their completed work either by MMS or by using the 3G network. Throughout this assignment, all exchanges with the lecturer were conducted on the mobile phones, thus making full use of the mobility afforded by the devices.

Delivery of learning material can also be carried over the Internet and consequently is not restricted to the cellular networks used by mobile phones. Accordingly, other mobile devices can be used, such as the iPod Touch which was the focus of the research conducted by Oberg and Daniels (2013). In this experiment conducted in Japan, students were able to access a digitised version of their textbook which was available online. With this learning scenario, students were able to pull the information they required at the moment they needed it. However, since the iPod Touch is dependent on Wi-Fi, learning was confined to the classroom and thus full mobility was not explored.

Another study using iPads was conducted in Australia by Kinash et al. (2012). In this research, the students were given the opportunity to access their course's LMS through the iPads. Findings revealed that some students perceived the mobile device as an advantage over other forms of access such as computers, whereas others did not see any benefit to the tablets. Even though the iPads were lent to the students for use outside of the classroom, Kinash et al. (2012) did not report on the location where the devices were used and instead focused on the patterns of usage.

Also using mobile Internet, Isham Shah Hassan et al. (2010) conducted a study where architecture students could gain information related to the design process on a website. Although this feature facilitated access to information, Isham Shah Hassan et al. (2010) remarked that the high cost of mobile Internet could be a hindrance to the use of the service. Similar findings regarding the prohibitive cost of mobile Internet were also noted by Ally et al. (2007), Nah (2011), as well as Santos and Ali (2012). Consequently, the additional cost of using mobile Internet was taken into account in the present study.

METHODOLOGY

A grounded action research method was employed over a period of one and a half year in four French as a foreign language courses. The selection of this qualitative method resulted from two research requirements. First, an intervention was necessary in order to improve on the learning situation. Second, due to the novel nature of the technologies employed, an exploratory method was necessary. From the variety of grounded theory methods available, the systematic method of analysis presented by Strauss and Corbin (1990) was selected. This choice arose from the need to consistently analyse data during each cycle of the intervention, in spite of changes in the implementation. In the four courses where the implementation occurred, course notes were delivered through Facebook after having been converted to a mobile format. Data collection was conducted through online observations and interviews during the six cycles of implementation.

Research Design

This research was planned to answer the research questions by following a qualitative paradigm and by analysing the data using a grounded action research method (Baskerville & Pries-Heje, 1999). During three university semesters, one cohort took part in a learning scenario where all the students accessed an SNS through their mobile phones. The three semesters were divided in six action research cycles as illustrated in Figure 2. Lessons learned from initial cycles guided the intervention conducted in subsequent cycles.

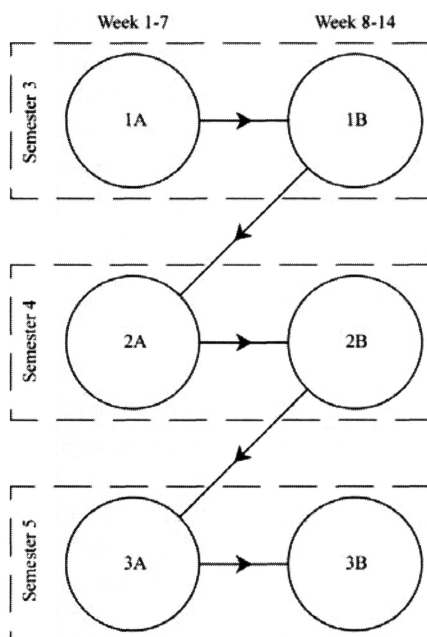


Figure 2: Six-Cycle Action Plan

Sampling

As required in qualitative studies (Creswell, 2005), a purposive sampling method was utilised. In the present study, a theoretical sampling method was employed which was subsequently refined with a snowballing technique. Similarly to all nonprobability sampling methods, theoretical sampling assumes that not all respondents are equal. Indeed, the use of this

sampling method implies that some respondents should be selected over others for their ability to provide relevant information at each step of the research. Such an approach was conducted by first inviting the whole cohort for group interviews. This cohort was composed of seventeen second year students pursuing a Bachelor degree in French studies in a Malaysian public university. The group interviews' analysis identified four students as expert informants due to the richness of their responses. These four students were subsequently invited for individual interviews, and were asked to propose other students from their cohort they viewed as knowledgeable on the use of social networking sites and mobile devices. The theoretical sampling method was applied in each cycle in order to respond to the evolution of the research. Consequently, a total number of ten students participated in individual interviews at various stages of the study.

Implementation

For each of the four courses in which this research was conducted, students had the opportunity to access course material and administrative information on the SNS. This use of the SNS as an LMS is similar to what Selwyn (2007), as well as Loving and Ochoa (2011) have described. Before course material could be delivered to the students' mobile devices through the SNS, it needed to be adapted. Previous surveys (Gabarre & Gabarre, 2009b, 2010a) of different cohorts of students' level of equipment had revealed that most mobile brought to the classroom were not able to open PDF files or Microsoft PowerPoint documents. As such these documents were converted to a format which could be opened by all mobile devices. A similar limitation encountered in a previous study (Gabarre & Gabarre, 2009a) was resolved by converting the course notes to animated images, as most phones were able to view them. The flaw of this designed resided in the students' lack of control over the animations. In the present study, the course notes were converted to images and organised in photo albums. These photo albums were uploaded to the SNS and organised according to the weekly progression of the French courses. Converting Microsoft PowerPoint files to photo albums was carried out in two steps. First, the presentation file was saved as a PDF document where each page of the document held one slide of the presentation. Second, the PDF document was converted to images in the JPG format. This was done from freely downloadable software such as Free PDF to JPG and on online sites such as pdf2jpg.net. When the newly

created photo album was uploaded to the SNS, the students were informed of its availability through SNS notifications either on their computers or on their mobile phones when the relevant application had been installed.

Data Collection

The entire cohort of seventeen students was divided into four groups of four and five respondents. These groups were formed on the basis of students' affinity. Group interviews with the participants constituted the first source of information as they provided the researcher with rich data to answer the research question. Subsequently, and in an opportunistic sampling approach, four students were selected as participants for this research. They were selected on three criteria, (1) willingness to share their experience, (2) ability to clearly express their thoughts and opinions, (3) and capacity to bring insight on the research questions. The one-on-one interviews blended two techniques described by Flick (2009): semi-standardized interviews and expert interviews. By blending these two types of interviews, the researcher aimed to combine the advantages provided by each.

Data Analysis

As the study progressed through each cycle following the action research method selected, data was collected and analysed concomitantly. All data were analysed in light of the different challenges, setbacks, reflections and improvements encountered with mobile Facebook in each cycle. A two-level coding scheme adapted from Strauss and Corbin's (1990) grounded theory has been retained for the data analysis. To streamline the coding process the ATLAS.ti software was used. Open coding was the first step in data analysis after collection and transcription. It is at this stage that the researcher delved into the data and began to assign codes to segments of information. Different segments of data were analysed depending on the researcher's intent. Subsequent to open coding, axial coding was conducted on the data. Strauss and Corbin (1990) defined axial coding as "a set of procedures whereby data are put back together in new ways after open coding, by making connections between categories. This is done by utilizing a coding paradigm involving conditions, context, action / interactional strategies and consequences" (Strauss & Corbin, 1990, p. 96). The method of axial coding takes the codes created through open coding

and networks them through relational links. As such, axial coding diagrams were constructed. These are presented in the Findings section along with description of the relevant themes which were identified.

FINDINGS

Findings revealed issues with the implementation which was corrected over time. Overall, students positively responded to the new platform of delivery. A working model describing learning a foreign language with Facebook on smart phones was constructed, and best practices guidelines were identified.

Findings are organised into four sections. The first section discusses the issues which were faced while implementing the new delivery system. The second section deals with mobile course material. The third section addresses delivery as an inherent function of m-Learning. Finally, the fourth section relates to delivery and the acceptance of technology. All four sections are illustrated with excerpts from the students' interviews. These excerpts are verbatim transcripts except for corrections to language use. All interview citations are presented with their ATLAS.ti references.

Issues with the Implementation

This study employed an action research method to root out problems in the implementation as they emerged. In the initial phase, issues with both mobile devices and the SNS were identified. Three problems were encountered with the smartphones. These were due to (1) network problems, to (2) the phones being too intrusive, and to (3) limitations of the devices. The issue of connecting to mobile Internet was reported as the main cause of problem to using the devices in the implementation. Students complained of poor 3G signals throughout the campus, and the unreliability of Wi-Fi signals. Such criticisms were in fact mentioned as pertaining to both laptops and mobile phones, since the former also mainly rely on these channels to access the Internet. To clarify this issue, several surveys of Wi-Fi and 3G signal strengths were conducted within the faculties, the residential halls and the canteens frequented by the students. Findings revealed inconsistent Wi-Fi signals throughout the campus, whereas 3G signals ranged from good to average. Such findings suggest that 3G should be favoured when a Wi-Fi

signal is either not available or reliable. The theme of network problems is clearly depicted in this passage taken from the interviews:

*And like they cannot like directly go online or maybe they need to find some area that has a Wi-Fi access... then... ah... it's a bit hard... But sometimes when we are in college... hmm... We don't have the... Wi-Fi. **The Wi-Fi's line is terrible.** We cannot go online.*

(Valérie C1:4:197)

Although this study aimed to understand how the implementation could improve the students' learning experience by harnessing the ubiquitous access to an SNS, it also revealed negative aspects of ubiquity. The ability to be contacted anywhere and anytime which the mobile phones provided was perceived by some students as too intrusive.

Issues of distraction in the classroom due to phones were reported. Students explained that they would be disturbed by others' phones whenever they would ring or even vibrate. Moreover, students complained of others replying to SMSs while in class. For them, this intrusion distracted their attention to the lectures. Such a theme was also identified by Campbell (2006) who advocated implementing classroom policies to regulate such issues. The following verbatim excerpts from the interviews illustrate the theme of mobile phones' intrusiveness.

*Then... one of my friends, Nadège, her phone **it keeps ringing and keeps vibrating for SMS**, then suddenly... hmm... when the lecturer starts the lesson: "Okay, students we are going to start a new chapter", then ting-ting. The hand phone is ringing, then she answers very slowly, slowly, then... she starts... every time... she will... answer the SMS.*

(Annaelle C1:1:83)

The size of displays on mobile devices is not a new issue. Several authors (Kukulska-Hulme, 2007; Maniar, Bennett, Hand, & Allan, 2008) have reported on the difficulties of mobile learning imposed by the small screens available on mobile phones. Although a small screen is an inherent necessity for ubiquity, it poses a challenge to learning applications.

Complaints were recorded that information downloaded from the Internet was not always displayed as it was intended to on the phone's screen. On the other hand, computers did not exhibit the same flaw. Another argument in favour of laptops was the ability to easily install foreign language learning applications. Students complained of difficulties in finding mobile language applications for their studies.

*I think the **display is too small** on the handset. I prefer it on the laptop.*

(Henri C1:2:345)

*I still can log in, but then it's not everything... **I can't see everything** like what I see on the computer.*

(Laurence C1:3:27)

*And sometimes **it's hard to find the application** for the language [...] It's hard to find the right application. Then **it doesn't work**.*

(Ariane C1:2:169)

Mobile Course Material

Similarly to what has been demonstrated in other studies on MALL (Chinnery, 2006; Ros i Solé, et al., 2010; Uther & Ipser, 2012), mobile Facebook relies on smartphones to deliver learning content. However, instead of designing specific applications to deliver this information, an existing SNS is utilised. Facebook facilitates the delivery of course notes to the mobile phones, once they are converted in photo albums. The students' perception of this facet of mobile Facebook was extensively described during the interviews. An axial coding model was constructed by identifying the relationships between the themes identified at the open coding stage. This model describes the students' view of the delivery of lecture notes.

With the delivery of lecture notes in a mobile Facebook setup as the central phenomenon under investigation, the individualist learning theme was identified as the context. In the coding paradigm, the intervening condition was found to be the students' traditionalist learning view. As can be seen in Figure 3, the delivery of lecture notes caused the ease of access which had for consequence a perceived ease of learning. The themes used for the construction of this model are henceforth described.

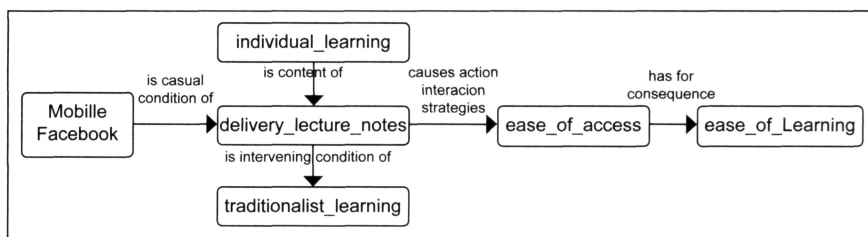


Figure 3: Axial Coding Diagram of Delivery of Lecture Notes in Mobile Facebook

Individualist Learning

The data was first analysed through open coding to identify descriptive themes. These were subsequently combined into broader abstract themes. One such abstract theme was labelled as individualist learning which encompasses the themes of learning alone, learning with the Internet, and students' notes. This theme was identified as the context in which the delivery of lecture notes was conducted.

The learning alone theme was used to interpret all instances reported by the students of autonomous learning. In spite of the numerous instances where students reported enjoying studying with their peers to improve their French, five out of the seven students who were interviewed stated that they normally learned alone. The following excerpt depicts this tendency.

I learn best on my own, because I'm a very individualistic person. I don't know why. Maybe the situation and, and the students it's like that I don't know.

(Annaelle C2:2:133)

Grouped with the learning alone theme, the learning with the Internet describes the phenomenon where students source their information on the web. Under this label, this activity was conducted alone and served as an academic purpose. Students explained that they used the Internet to help them do their homework and to find information which helped them to learn French. For the students, the Internet is viewed as a primary learning tool. In this instance learning should be viewed in light of the learning/acquisition distinction made by Krashen (2009). The following passage illustrates this theme:

*Like conjugation sometimes it's pretty confusing, so there's **a site I found on Google**, like *La conjugaison*, and then everything is inside, so we just type in the word and everything will come out imparfait, conditionnel, everything.*

(Marie-Thérèse C2:7:138)

The students' notes theme was used to describe events narrated by the students when they compiled information from their lecture, from books, or from the Internet into their own notes. Although these notes are generally used to study prior to the exams, writing them also facilitates the process of memorising and understanding their content.

*My own notes is my notes after I understand all the things then I summarize it or do it in my own sentence, [...] then **I jot down some important notes**, and then the days before exam... then I only revise again.*

(Nolwenn C2:1:214, 230)

Traditionalist Learning

The traditionalist learning theme stresses the importance of the course content provided by the lecturers as a means to learn. Similarly to the theme of individualist learning, this theme highlights an approach to learning which does not rely on the group. This theme was identified as the intervening condition which enabled the lecture notes to be viewed as essential to learning, notwithstanding their channel of delivery.

Within the traditionalist learning view, students rely on traditional methods and resources such as books and their lecturers. Students view the books as a reliable source of information which they value for the purpose of learning French. The following passage illustrates this view:

For general course, we always refer to the textbook if there's any.

(Sarah C2:6:182)

The learning formal theme was used to identify the phenomenon of learning in the classroom. Comforting the traditionalist learning view, this theme was used in instances where instruction was viewed as being predominantly provided by the lecturer. In this traditionalist view, the

lecturer is viewed as the main source of information. However, students claim that for cultural reasons, they are often unable to request additional information from their lecturers. Consequently, questions are rarely asked. The following passage demonstrates this point:

*Hmm, I'm not sure maybe the culture is like that. **We don't like to ask [...]** Maybe **we feel shy** or maybe we're **scared of the lecturer**.*

(Sarah C2:2:167-168)

Moreover, in the traditionalist view of learning, questions were generally asked away from the group when the lecturer came to see individual students. A similar behaviour was observed by Bouvier (2003) and Shun-I Lui (2002) in traditional Asian settings. It is probable that students reproduced this cultural pattern on the SNS, and consequently, refrained from using the social media to post their questions. As a consequence, questions were not openly posted on Facebook. This is described in the following quote from a statement made by Annaelle:

*Sometimes if they have a question, **they are not simply asking in Facebook**, right? They come to you, at your class, and then they will ask, right? Sometimes, I think that **we have to ask face to face not on Facebook**.*

(Annaelle C2:2:104)

Ease of Access

The ease of access which resulted from the mobile Facebook's delivery of lecture notes was highlighted during the interviews. Students justified this ease to the combination of mobile devices and the SNS. The portability of the mobile devices was a facilitating factor which enabled the lecture notes to be accessed anywhere. The following passages demonstrate this ease of access:

*But I now just go online cause obviously I go to **Facebook every day** so whenever I go into Facebook and like this study week, I go to **Facebook and I study at the same time**.*

(Marie-Thérèse C2:7:164)

Ease of Learning

The ease of access resulted in an ease of learning. As students could readily access their notes while in class, in the college or even while waiting for the bus, novel opportunities to learn appeared. Students explained that the delivery of lecture notes with the SNS on their mobile phones had made their learning experience easier. This is demonstrated in the following quotes taken from the interviews:

*But, for these two courses it's **easier**, because **we just look at the slides** that are uploaded then we can just rely on these slides.*

(Sarah C2:6:189)

Delivery through M-Learning

Following the seven weeks of mobile Facebook implementation, data from the interviews and the observations were analysed. During the open coding phase of the data, five themes related to m-Learning emerged. These were the location of use, the notion which distinguishes between the usage of laptops and mobile phones, recourse to the Monitor through the mobile device, the notion of ubiquity, and the theme of delivery of learning material. As can be seen in Figure 4, the theme related to choosing between a laptop and a mobile phone was related to location.

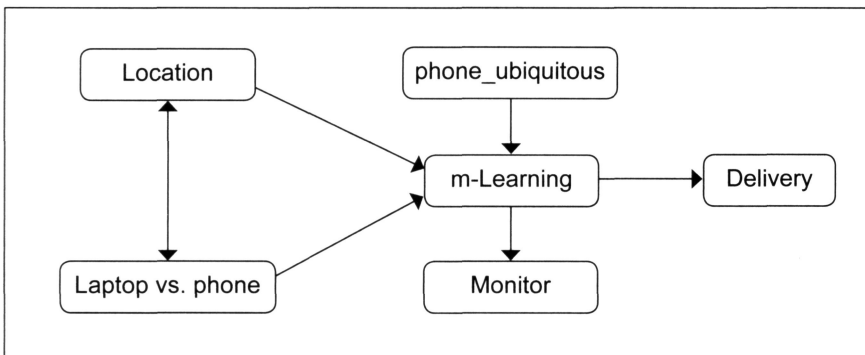


Figure 4: Open Coding Diagram of M-Learning in Mobile Facebook

Location

It appeared that location was a determining factor in the choice of technology employed in m-Learning. Students reported that they would use their phones when in class, in transit to attend their class, or while in the cafeteria. Findings pertaining to location are in line with research conducted on m-Learning (Gikas & Grant, 2013). Undeniably, mobility is the key determinant distinguishing e-Learning from m-Learning. On the contrary, it was also reported that using smartphones to learn while on the bus was not feasible on campus due to the sheer number of passengers during peak hours. This is in contrast with the perception that commuting affords the opportunity to engage in phone related activities (Paragas, 2005). Moreover, the short commute time between the residential colleges and the faculties could justify the reported lack of prospects to conduct m-Learning activities while in the bus. Nevertheless, opportunities to access the lecture notes on the mobile phones presented themselves while students waited for their transport. This report does not infer that m-Learning was the sole activity which occupied students in these locations and moments. Indeed, students also used their phones to listen to music or play games. The importance of location is highlighted in the following excerpts from the interviews.

Every time I want to know about certain words, I would just use it... not necessarily in the class really, sometimes I was in the bus stop, and then I remember some words that I feel that I don't know the meaning, I will just search it.

(Zoé C3:1:246)

Selecting Between a Laptop and a Phone

Location is a key determinant for the choice of technology. Students explained that they used their laptops in the university's hostels. Due to the impracticality of carrying a laptop at all times, students resorted to leaving their computers in their rooms. In a research conducted across three universities in the United States, it was similarly reported that students find it "more convenient [and] hardly ever take [their] laptop to class" (Gikas & Grant, 2013, p. 21). As a matter of fact, impracticalities related to weight and finding a power outlet to recharge the device were justified as factors classifying laptops as portable rather than mobile. A majority of students

return to their rooms whenever they have free time between classes. As such, this provides them with the possibility to access the SNS on a larger display. This information triangulates with previous findings from Cycle 1A pertaining to difficulties with mobile phones. However, the size of the screen was not the only issue as it was also reported that the photo album format for the lecture notes was not always practical on phones with a small memory capacity. On the other hand, new and contradictory information on the usage of mobile phones was brought forward during Cycle 2A. It was discovered that students such as Valérie and Annaelle, preferred to access the SNS and the course notes on their smart phones rather than on their computers. This is depicted in the following selected passages.

When revising for the test, I can lie on my bed and check with my phone. I downloaded all the notes to my hand phone so that I can just take it out and check on the notes and read them.

(Valérie C3:6:200)

I think for this semester I never used my laptop. To upload a video also, I'm using my telephone, it's very easy, and I don't need to look at the computer. For me, it's difficult if I'm using a computer, if I'm using a hand phone it's okay.

(Annaelle C3:8:64, 105)

The ease of using their mobile phones in several locations was related to the ubiquity of the mobile device. Moreover, due to the simplicity of accessing the course notes, students noted improvements in the way the course notes were delivered. Ariane explained that:

You open the pages for French, and you... open the presentation, and you read it, then you take note for it. Or you can download the presentation.

(Ariane C3:2:154)

Access to the Monitor

The third theme linked to m-Learning is access to the Monitor. This is directly related to Krashen's (2009) theory of second language acquisition and the Monitor hypothesis. Students reported using their mobile

devices to check on grammar rules and to verify the meaning of words in French. Recourse to the Monitor was not only executed by accessing the mobile course notes, but also by using the installed applications on the mobile phones. Students readily used the dictionaries and the conjugation application on their phones whenever they felt unsure of the correct French usage. Using dictionaries on mobile phones has long been identified as a prime activity in MALL applications (Godwin-Jones, 2005, 2011). The knowledge of the existence of a specific rule was a sufficient trigger to have recourse to the Monitor. This is seen in the reports offered by Valérie and Yolande:

*Because sometimes, I will forget how to conjugate a verb like some irregular verbs which are not commonly used. I will forget it, so I will just **check on it with my phone**.*

(Valérie C3:6:234)

*When we don't know automatically **we will search the dictionary** for the word that we don't know how to say in French. Then at the same time, we will improve our vocabulary.*

(Yolande C3:7:173)

Delivery and Technology Acceptance

The axial coding process was used to articulate several themes around the central phenomenon of delivery as presented in Figure 5. Delivery as a cause of mobile Facebook was observed in light of the difference between an LMS and an SNS. Students expressed their perception of these two methods of delivery. Consequently, issues pertaining to the features of the LMS were viewed as the intervening condition of delivery, whereas the phenomenon of compulsive SNS-Learning was identified as the context of delivery. Perceived ease of use was identified as the interactional strategy which had for consequence technology acceptance.

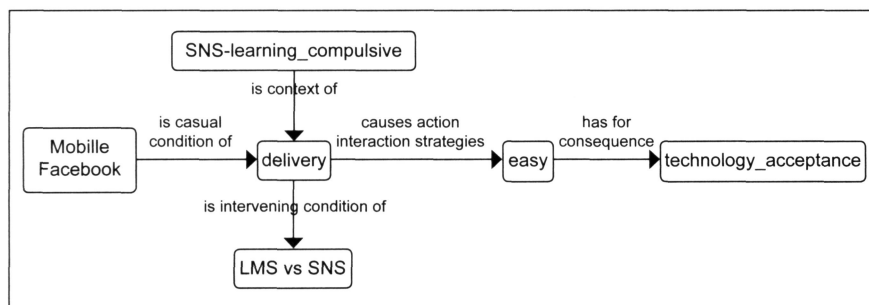


Figure 5: Axial Coding Diagram of Delivery and Technology Acceptance

LMS vs SNS

As demonstrated in the literature review section, studies investigating the replacement of an LMS by an SNS emerged to compensate for the general shortcomings of the former. In several cases, an SNS was used to replace the LMS (LaRue, 2012; Meishar-Tal, Kurtz & Pieterse, 2012), while in others the SNS complemented the LMS (Chua & Choo, 2013; Kent, 2013). Although these studies revealed the imperfections of the SNS as an LMS, they demonstrated the feasibility of using an SNS in education in spite of such limitations. In the mobile Facebook implementation, data specifically pertaining to the LMS replacement with an SNS for course notes delivery concurred with these past studies. During Cycle 3A, students in the cohort were in their fifth semester. They had been exposed to the university's LMS from their first semester, and had expressed their dissatisfaction with its features on several occasions. These dissatisfactions were to some extent contributing factors in the genesis of the present study. The introduction of the mobile Facebook platform did not spell the end of these discontents, as students still used the university's LMS in their minor courses, in the university's compulsory courses, and in their other French courses which were beyond the scope of the implementation under investigation. The following passages relate the students' perception of the LMS as a delivery tool, and their comparison with Facebook.

*I think, the **LMS is not really functional**, because sometimes the lecturer posts something on it, and then **we cannot receive**. Everyone's got their own Facebook account, and then they almost*

access to Facebook every day, so mostly they will download themselves, but not from the LMS.

(Valérie C5:3:151,156)

*If I rate the speed, **Facebook is much, much faster than the LMS**, although there are a lot of applications, the speed is much better than the LMS.*

(Yolande C5:7:100)

Perceived Ease of Use

As remarked in the following passages, students revealed that they perceived the mobile Facebook platform as easy to use. These excerpts strengthen this theme which was first identified in Cycle 2A by focussing more specifically on issues of delivery. A continued perceived ease of use was expected, since the mobile Facebook implementation combined two delivery technologies which the students were already accustomed to using on a daily basis. In fact, the design of the mobile Facebook platform had been planned in order to incorporate tools which could emulate the features of the LMS without presenting the students with a steep learning curve. Perceived ease of use has been linked to both m-Learning and SNS-Learning. Liu et al. (2010) investigated the factors which determine the acceptance of m-Learning. They discovered that personal innovativeness, which is determined by a person's willingness to engage with a new technology, was a predictor of perceived ease of use. Through observations of the students' use of the mobile Facebook platform, it was assessed that from the cohort of seventeen students, only one student demonstrated a low level of personal innovativeness. This low ratio could in part justify the recurrence of the perceived ease of use theme in the data. With regard to the perceived ease of use of an SNS, the theme was encountered by Chang et al. (2014) in their study on Facebook. They discovered that "perceived ease of use was the primary factor that predicted whether users would continue using SNSs" (Chang et al., 2014, p. 1). Moreover, this theme was strongly correlated to usage attitude. Such findings comfort the observations conducted in the present study as well as the reports furnished by the students during the interviews. The following passage highlights the theme of perceived ease of use in relation to the concept of delivery:

*I would say **it's more convenient and easy** for the students to use, because normally in LMS we have to download and it takes time, but if it's in **Facebook**, we can just click in the picture, then we can read. But with the LMS we have to download, and then we have to open.*

(Marie-Thérèse C5:2:176)

Technology Acceptance

Previous research on the technological acceptance model has linked perceived ease of use to the continued intention of using a technology (Venkatesh, Morris, Davis & Davis, 2003). As ease of use was sought in the design of the mobile Facebook platform, it was anticipated that students would readily embrace the personal tools which were already dear to them. However, in light of the connectivity problems and the numerous issues which had been identified in the first cycle, it was not expected that students would unreservedly favour the mobile Facebook platform over the university's LMS. Findings from Cycle 3A stress the students' technological acceptance of the mobile Facebook implementation over the LMS which they concomitantly used. These findings contradict Lui et al.'s (2010) report that ease of use was not correlated to the intention to use the technology. However, findings from the present study concur with the accepted models presented by Legris et al. (2003) as well as Li et al. (2008) which link perceived ease of use to technology acceptance. More specifically in the field of m-Learning, Cheng's (2014) findings concur that perceived ease of use is the main factor which predicts intent to use. The following passage provides evidence of this acceptance.

*Facebook, I can, I can, **I can access Facebook through my phone**, but the LMS, I cannot access through my phone, so **I think Facebook is better than the LMS.***

(Ariane C5:10:159).

DISCUSSION AND CONCLUSION

Improving the students' experience with the distribution of learning material was one of the main purposes of this study. Findings illustrated in Figure

3 and Figure 5 reveal the perception of delivery in the mobile Facebook implementation. In the first axial coding model, delivery is linked to both individualist and traditionalist learning behaviours. Delivery was interpreted in the context of individualist learning, as students accessed the lecture notes on a personal device. Traditionalist learning was interpreted as the intervening condition, as students valued information provided by their lecturers, as well as printed material. In the second axial model, delivery on the mobile devices is viewed in the context of compulsive SNS-Learning, and the intervening condition of using the SNS as opposed to the LMS. Compulsive SNS-Learning was identified as a process resulting from the notifications received on the students' mobile devices each time new lecture notes were uploaded. This caused the students to instantly view the lecture notes as soon as they were available. Such a system was frequently contrasted to the delivery of lecture notes on the LMS, where students were not aware of the availability of new material. In both axial models, delivery on the mobile devices facilitated access to the learning content as students deemed this channel easy and convenient. This resulted in perceived ease of learning, since access to the Monitor was simplified, and in the acceptance of the technology to learn a foreign language.

The first research question focussed on improvements in terms of distribution of learning material. Regarding distribution of learning material, the mobile Facebook platform served its purpose efficiently. As students compared the university's LMS with Facebook and their mobile devices, they noted the advantages of the new system over the previous one. Delivery was associated with a perceived ease of access, ease of learning, and the technological acceptance model as defined by Venkatesh et al. (2003). Notifications received on the students' mobile devices alerted them of changes on the SNS which they promptly accessed. Although issues were described pertaining to the delivery of multimedia documents, such complaints remained minor in comparison to the difficulties reported in accessing the LMS. During the interviews, it was noted that students mainly perceived the delivery of learning material as initiated by the lecturers. Although less frequently, students also initiated this delivery by sharing documents and links in the SNS. In the present study, learning material was not restricted to documents shared by the lecturers and the students. Indeed, learner-created material was shared and reviewed on the mobile Facebook platform. Students explained that they viewed videos created by their peers

as documents which enabled them to improve their language proficiency. However, students did not assimilate the sharing of such documents with a form of delivery, even though they accessed them on their mobile devices. This view may be explained by the fact that the university's LMS did not enable students to upload documents to the platform. As such, students only perceived delivery as a feature which could be associated with the previous LMS.

The second research question sought to identify the processes which foreign language learners underwent as they used the mobile Facebook setup. Several processes were identified as the students used the mobile Facebook platform. These may be divided into conscious language learning processes and unconscious language acquisition processes. One learning process reported included when students deliberately switched the environment's language of their SNS. Student reported that by immersing themselves in the language, they would benefit from additional exposure to French. A study on the impact of the environment's language of an LMS revealed that using the target language did not have a significant impact on learning (Melton, 2006). Nonetheless, students claimed that by navigating Facebook in French they were able to learn new terms related to the SNS. Increased exposure was not the sole reason for switching the environment's language. Students explained that as French language students they wanted to have as many items in their lives which would be related to France and its language. This was achieved by purchasing phone cases featuring the Eiffel tower, carrying bags and wearing clothes with French text on them, and having Facebook in French.

Another process which the students reported on several occasions was related to learning while having fun. Students explained that using Facebook to learn French was entertaining. Consequently, the use of the SNS was widely accepted in the French language courses. The purpose of this grounded action research was to provide the students with an optimal learning environment which would improve on the previous situation. Enjoyment to use the SNS as an LMS was a strong intrinsic motivator to frequently log into their network and connect with their peers. However, such motivation was primarily reported with the SNS-Learning component of the mobile Facebook implementation. The m-Learning component was not viewed in the same fashion, as reports of enjoyment with the mobile

technology were less frequent. This does not imply that m-Learning was perceived negatively. It merely indicates that SNS-Learning was more readily connoted with feelings of enjoyment.

Learning was also evidenced as students received SNS notifications on their mobile devices. In most instances, these were immediately read and led to the students accessing the French language lecture notes. These notes were not only accessed at the moment of their delivery. Indeed, students were observed reviewing such information while completing tasks in the classroom. In such instances, students had recourse to the Monitor to verify their knowledge of the grammar rules before communicating on the SNS. Such access to the Monitor in a MALL perspective was influenced by location, time, availability of networks and devices at hand.

The third research question dealt with difficulties encountered in the mobile Facebook scenario. Difficulties were primarily identified during the diagnostic and introductory cycles of the implementation. Issues which could be corrected were dealt with; those which were beyond the scope of this study were accommodated. Difficulties encountered in the mobile Facebook setup were constantly monitored in all cycles of intervention. These issues were primarily related to the use of the two technologies. Regarding the use of the SNS, students mainly complained of issues of privacy. These issues were resolved when the online course migrated from a Facebook page to a Facebook group. The researcher as an instructor having previously employed LMSs in his teaching perceived the absence of specific educational features. Such features which were absent were the lack of integration with computer-corrected exercises, or the ability to track student's progression. However, problems related to pedagogical inadequacies of the SNS were not reported by the students.

Since the end of the data collection phase of this study, other cohorts of French students have benefited from a mobile Facebook implementation. The positive aspects of this approach have led to the adoption of this method for all courses taught by the two lecturers involved in the present study. Until a new approach is identified, mobile Facebook will remain the model of choice for enhancing the students' French language acquisition experience.

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